THE FIELD SCIENTIFIC LIAISON WORK OF UNESCO

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UNITED NATIONS EDUCATIONAL,
SCIENTIFIC AND CULTURAL ORGANIZATION
19, Avenue Kléber, Paris 16e

INTRODUCTION

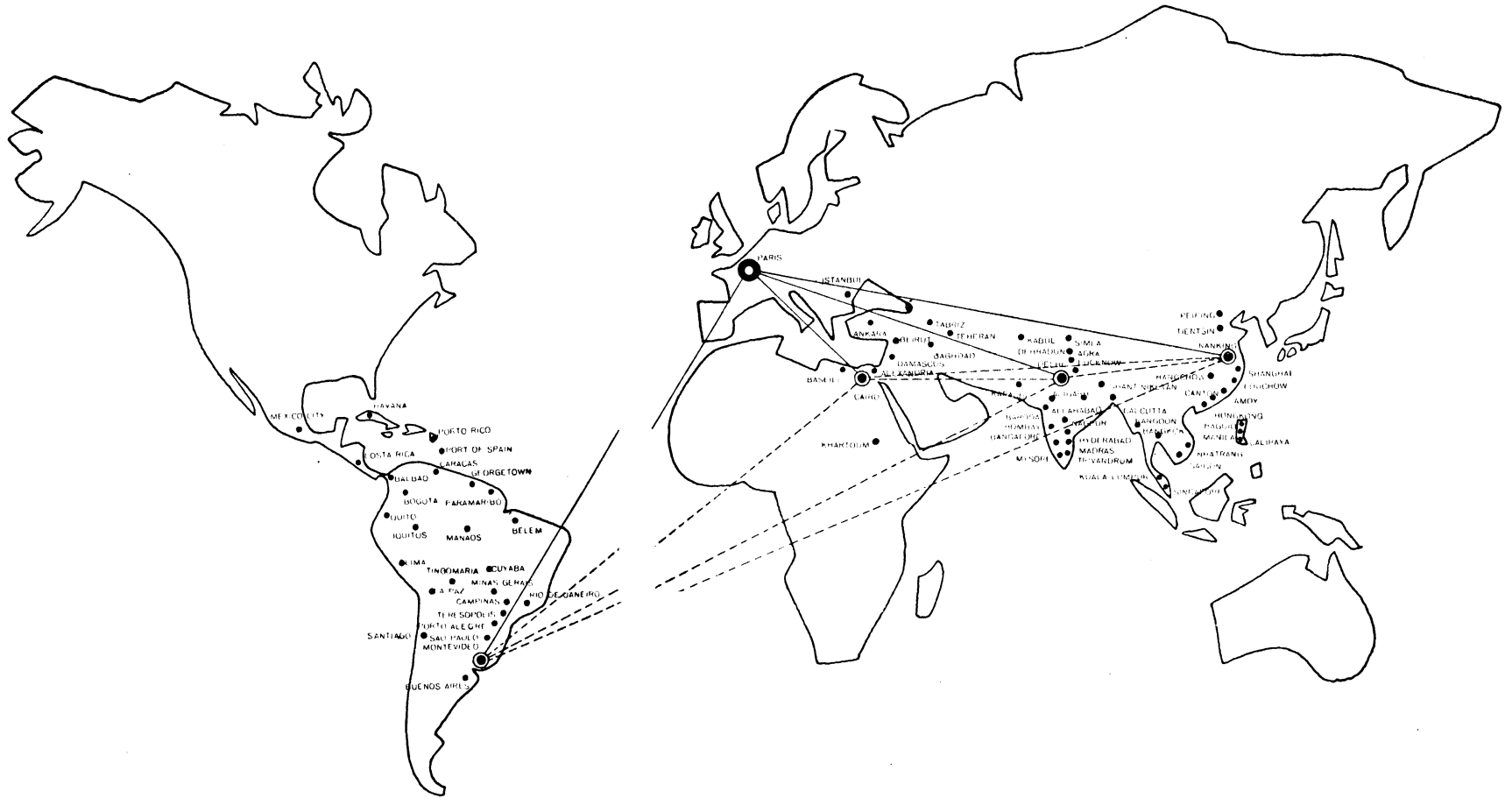
The Field Science Co-operation Office system is one of the most vital and useful of all Unesco's scientific activities. Yet very few people understand the ideas behind it or know what it is doing. Now that it may be expected to develop still wider and greater responsibilities — on account of its relevance to the plans for technical assistance to the economic development of under-developed areas, under the Fourth Point of the Truman Programme — a more general understanding of it is assuredly very desirable.

The present booklet is addressed to educated people everywhere, but it should be of particular interest to those who live in under-developed areas. It should appeal to university students, adult education groups, and technicians of every craft in the technologically advanced areas of the world. The inclusion of detailed reports of actual scientific liaison work in progress gives it also the character of a *compte rendu* addressed to working scientists, in both pure and applied fields, in all parts of the world.

It is hoped that it will reach all those who may be in a position to derive immediate benefit from the activities of the Field Science Co-operation Offices.

The booklet opens with a short account of the principles of international scientific co-operation in the past, contrasting the international scientific unions with the science co-operation offices. It then goes on to show how the Field Science Office system of Unesco combines the good points of both the methods of international scientific co-operation existing before 1944.

LOCATION OF SCIENCE COOPERATION OFFICES AND VISITS MADE



- Headquarters.
- Field Science Cooperation Offices.
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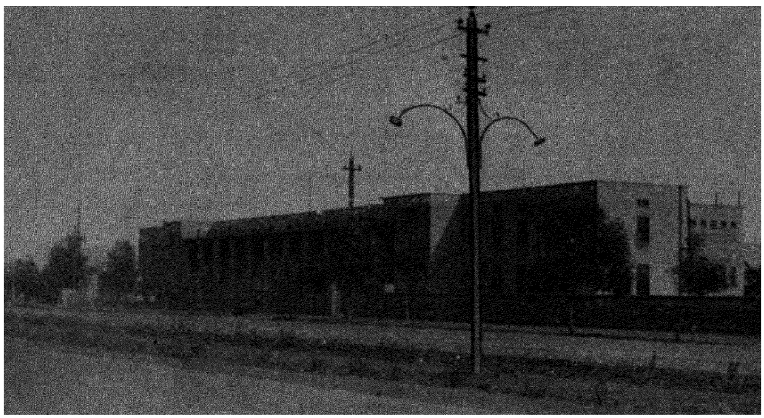
THE FIELD SCIENTIFIC LIAISON WORK OF UNESCO

THE COMMUNITY OF SCIENCE

Everyone knows that science is one of the most international of all human activities. The basic problem of peace and the unity of humanity is, after all, largely one of the true communication of ideas with the minimum of misunderstandings and the greatest possible proportion of shared experience. No doubt this idea is attained in its highest degree by mathematicians, but their communication is highly abstract and their subject matter relatively restricted. However, all the sciences participate to some extent in the universality of mathematical language, as we see whenever experts in any particular field come together. An economic botanist from Peru may have language difficulties in discussing matters of common interest with a colleague from India or Egypt, but that is only as regards everyday speech — the moment they make contact in the language of economic botany, they feel their unity and are at once at home together.

Almost from the dawn of science as a human activity, this unity of thought and expression has been felt. Herodotus, discussing geometry with the priests of Egypt suggested that it was from that country that Greek geometry had been derived. A Chinese book written in the second century A.D., the *Record of Plants and Trees of the Southern Regions*, acquainting its readers for the first time with the sugar-cane, also gave the first description in history of economic entomology, saying that in the south the growers of



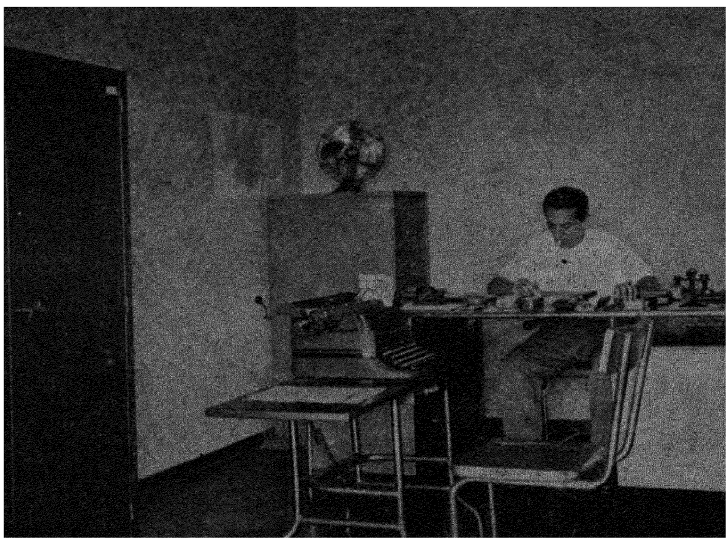
College of Engineering, Baghdad.

oranges were accustomed to buy bags of ants in markets, and hang them upon the trees; if they did not do this, the crop would be ruined by insect pests. Later, in the Arabic centuries, international scientific intercourse was important; learned men from every country in the world were welcomed at the court of Baghdad. After the fall of that city, in the thirteenth century, the Mongols continued the tradition, and Hulagu Khan set up what was then the best astronomical observatory in the world at Maragha in Persia. Thither came astronomers from east and west; one Fu Mêng-Chi from China met el-Andalusi from Spain, who later actually wrote a treatise on the astronomy of the Chinese and the Uighurs.

Characteristically the seventeenth century in Europe, when modern science and technology were at last free to develop, appreciated clearly the international character of science. That remarkable group of men who were concerned with the founding of the Royal Society, such as Samuel Hartlib, John Amos Comenius, Robert Boyle, and others, brought out a scheme for a scientific liaison system, which they called the "Office of Public Address" (meaning that any investigator anywhere could apply to it for information) and they appointed a Foreign Secretary of the young society : Henry Oldenburg. He it was who opened one by one that wonderful series of letters from the Dutch microscopist Leeuwenhoek, in which the hitherto hidden new world of microscopic dimensions was for the fisrt time revealed. The archives of the Royal Society still contain a mass of correspondence on scientific subjects received and sent out by the Society.

THE INTERNATIONAL SCIENTIFIC UNIONS

In modern times, the astronomers began international co-operation early in the nineteenth century, and somewhat later the system of triennial international congresses, which still continues, grew up. But it was after the first world war that the need for systematic scientific contact and interchanges resulted in the setting-up of really stable organizations. In 1919, the International Research Council was formed, and out of it there gradually grew up the wide-reaching system of international non-governmental scientific organizations, or unions, as they are called, which are federated in the International Council of Scientific Unions (ICSU). Each scientific subject has such an association : — physics and chemistry, microbiology, zoology and radio. While a few countries belong to these



The Field Science Co-operation Office of Unesco at Montevideo, Uruguay.

organizations through their governments, the great majority do so by means of their national academies or appropriate specialist organizations, such as the Italian Biochemical Association or the Royal Astronomical Society in England. Each country which belongs pays a certain subscription, but the unions are also powerfully helped by financial grants from Unesco. Their work includes the arrangement of meetings, symposia, and conferences of all kinds; the provision of travel and transportation funds and facilities; the publication of reports and other scientific material; and last but not least, the upkeep of international scientific laboratories, not so much for original research as for the pooling and preparation for use of scientific results obtained in the national laboratories of the various countries. We have not the space to describe the work of the International Scientific Unions in detail, the object of this booklet being to present the original idea, present work and urgent needs of the *Field Science Co-operation Offices* (FSCO) of Unesco.

THE BEGINNING OF SCIENCE CO-OPERATION OFFICES

During the second world war, communications were interrupted between many countries, and the Unions went, so to speak, into a state of suspended animation, from which, however, they recovered when peace came. But the second world war produced an entirely different form of organized international scientific liaison, namely, the Science Co-operation Offices. In order to mobilize their scientific resources against the Axis Powers, the Allied Nations found it essential to set up and maintain in one another's capitals Science Co-operation Offices, so as to facilitate in every way the flow of scientific and technological information. There was, for example, the British Commonwealth Scientific Office (BCSO) in Washington, where some 25 scientists from different parts of the British Commonwealth, sometimes concurrently Attachés at their respective Embassies, worked hard to organize mutual aid in such matters as radio, industrial chemistry, food dehydration and penicillin. Scientific missions of the same kind were maintained by the Americans, Australians and New Zealanders in London, by the French in Montreal, and by the British in China.

The last-named science co-operation offices bore the seeds, as it turned out, of a new departure in international scientific relations. While most of the other Science Co-operation Offices devoted

probably 80 per cent of their time to war science, the Sino-British Science Co-operation Office (SBSCO), with its headquarters in Chungking, had a rather different assignment. Owing to the relatively unindustrialized condition of China — especially in the western provinces upon which the Government and the people, protected by the army and the mountains, had fallen back — only some 30 per cent of the work of the office fell into the war science category; the rest of its time could be devoted to helping Chinese science, both pure and applied, for peaceful purposes. Thus for the first time the real value was seen of a scientific liaison office in a great country in need of construction as well as reconstruction. If, in what follows, examples are frequently taken from Chinese conditions, it is partly because of this fact.

The Sino-British Science Co-operation Office (which was under both Governments, the British and the Chinese) was staffed by some six British and ten Chinese scientists. During the four years of its full operation, it arranged for scientific equipment to be flown in "over the Hump" from India to help to keep the wheels of Chinese science and industry turning. Its staff visited Chinese laboratories, factories and arsenals, and it sent out about 140 original scientific papers by Chinese scientists for publication under the better conditions of Europe and America. The visits — absolutely necessary in order to establish contact with the men at the bench, the mine and the experimental farm — involved thousands of miles of travel by all sorts of means : SBSCO's trucks, Chinese planes, trains and buses, wheelbarrows, bicycles, Mongol ponies, camels, and on the rivers by junks sampans and skin-float rafts.

AID FOR UNDERDEVELOPED REGIONS THROUGH SCIENCE

We shall return to the actual life of scientists and technologists in the field. Here it is not perhaps out of place to point out the romantic quality of the kind of scientific liaison work which, for example, the SBSCO carried out. Some of those who were with SBSCO have given accounts of the work. Its background was, as two of them put it : "the unconquerable pertinacity of a great nation, emerging from an agricultural quasi-feudal culture, mastering the modern sciences and technologies, and striving, in spite of imperialist aggression, to raise the standard of life of its people".

No great insight was needed to see, behind the passionless terminology of kilowatts, insect vectors, jurassic alignments, and the like, the initiatives, the sacrifices, the endurances, the faith and hope of a whole generation. Again : "At Chiatung, one discussed nuclear physics in the family temple within sight of the mountains of Tibet ; in the caves of Kuangsi one found large power stations with engineers dying to talk to a technologist from the outside world ; and among the aboriginal tribesfolk of Tali one helped a planktonologist to launch his boat on the lake of Erh-Hai beneath the Tower of the Five Glories".

The remarkable mingling of the old and the new gave a particular quality to the scientific liaison work in China. On the hills near snow-covered Yao-Mo-Shan, in the Nan-Shan mountains, along the Old Silk Road between the Gobi Desert and the Tibetan Plateau, you would meet first-rate Chinese geologists exploring the terrain, or a Chinese geophysicist setting up his apparatus beside an ancient temple to Lao-Tzu. The heroism and endurance of the Chinese scientists and technologists won the devotion of the foreign staff of SBSCO ; they were fighting what sometimes seemed a hopeless battle against the poverty and misery of the masses. Little Kansu children, practically naked in the bitter winter frost, gazed wonderingly at the theodolites and other equipment. At the other end of the vast country, in the heat of Kuangtung, other staff-members of SBSCO discussed hookworm infestation with overworked Chinese helmonthologists, visualizing the endless procession through the hospitals, and the infinitely greater crowds who would never reach a hospital. They had occasion to learn, too, what a dysentery ward looks like when, as on the Chinese fronts, an army has as much to suffer from its own lack of a national chemical industry as from the enemy's weapons.

All who worked in SBSCO agreed that it had been a great honour to do something to help the scientists and technologists of China in their struggle, not only *against* foreign aggression, but *for* minimum decent conditions of life for their fellow men.

The application of modern science and technology to raising the standard of life of all mankind to minimum civilized levels — and hence to the achievement of victory over famine, malnutrition, disease and misery, and thereby to the removal of one of the causes of war — will, it may be remarked, not be wholly successful unless modern scientists show the same devotion to these great ideals as Buddhist and Christian missionaries did in former ages to theirs. The men will not be lacking. One thinks of Noguchi from Japan, struck down in Africa by the yellow fever which he did so much to conquer ; of Pollitzer, the Austrian, following endemic plague in Fukien ; of the Englishman, Lindsay, setting up radio

communications for the Chinese guerillas; of the New Zealander Rewi Alley, establishing a whole technical college for co-operative apprentices in Central Asia.

It is not so easy to be sure that the other necessary condition will be fulfilled. The process of helping the peoples of the relatively "backward" areas to achieve minimum decent living standards is dependent upon the support which such men receive from the advanced nations. While scientists and technologists who form part of the administrative machinery of non-self-governingor colonial territories can do much, the modern ideal should surely be that they should work primarily under the aegis of the United Nations. They should not be felt to be the agents of an old-style colonial authority; should approach the peoples of undeveloped areas with no assumption of superiority; should know that some of these peoples have produced great men in the past, and that all will be able to do so when once the elementary needs of civilized life have been secured; should be aware that peoples of undeveloped areas have produced forms of art and culture as noble and beautiful as anything in that Euro-American technical civilization which has dominated, and now unifies, the world; and should understand that "all men are brothers within the four seas". For their fullest success they must be supported, not merely by this or that advanced country, but by all the nations of the world, acting in concert through their international organizations.

MULTILATERAL SPECIALIZATION AND BILATERAL UNIVERSALITY

Let us now note the difference between the International Scientific Unions and the Science Co-operation Offices. One interesting difference at once reveals itself. The non-governmental Unions were, and are, limited as to subject matter, each dealing with one special branch of science; but unlimited as to national scope, because a large number of countries belong to each union. The governmental Co-operation Offices on the other hand, were, and are (the British Commonwealth Science Co-operation Service, for example, continues in being) unlimited as to subject matter, being at liberty to deal with any branch of science or technology; but limited as to national scope, most of them being bilateral, i.e. only two nations being concerned. Another and very vital difference was

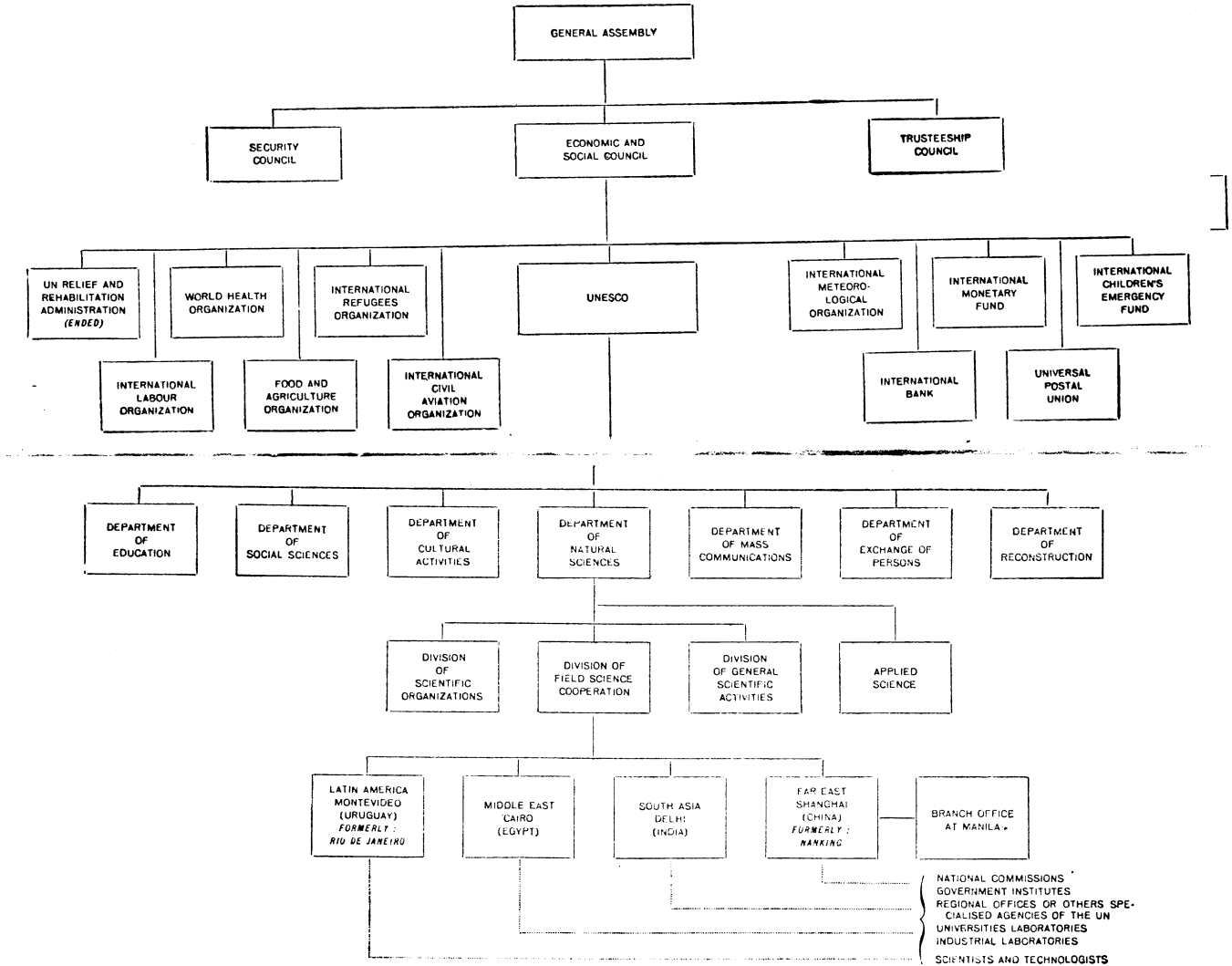
that the Unions were generally short of funds and facilities since they depended upon the voluntary co-operation of scientific societies and academies, which are rarely wealthy; while the Co-operation Offices were well staffed and endowed since they were, in effect, organs of governments. (This difference has diminished since Unesco began its policy of financial support for the activities of the Unions.) But the greatest distinction was that the Unions naturally tended to unite the scientists in those countries where science and technology were most advanced, while owing to the nature of the case, the Co-operation Offices, were, at any rate sometimes — as in the case of SBSCO — concerned with helping scientists and technologists in countries where science and industry were least advanced.

What Unesco has done, has been to combine into one system the principle of helping the Unions — the "church" of science, as Professor Kruyt, Ex-President of their International Council, once called them — with that of establishing Science Co-operation Offices in those parts of the world remote from the main centres of science and technology — which Kruyt aptly referred to as the "missions" of science. But before we can describe these Field Science Co-operation Offices, we must briefly refer to that other kind of intergovernmental collaboration which gave rise to Unesco.

THE BEGINNINS OF UNESCO

Something on a large scale, it was felt, was called for, and this conviction found expression at the Conference of Allied Ministers of Education, which met in London during the dark days of Nazi bombings during the second world war. At first it was planned to set up an organization, under whatever body might replace the League, for education and culture alone; but scientists in many countries urged that it would be unrealistic to leave science out, and at the constitutive General Conference held in London in November 1945, the title of Unesco (United Nations Educational, Scientific and Cultural Organization) was finally adopted. This took its place as one of the Specialized Agencies of the United Nations (see chart).

From the start, the crying needs of the underdeveloped countries were borne in mind. Already in 1944 Dr. Grayson N. Kefauver, who was advising the American State Department on the proposals,


GENERAL ASSEMBLY
SECURITY COUNCIL
ECONOMIC AND SOCIAL COUNCIL
TRUSTEESHIP COUNCIL
UN RELIEF AND REHABILITATION ADMINISTRATION (ENDED)
WORLD HEALTH ORGANIZATION
INTERNATIONAL REFUGEES ORGANIZATION
UNESCO
INTERNATIONAL METEORO-LOGICAL ORGANIZATION
INTERNATIONAL MONETARY FUND
INTERNATIONAL CHILDREN'S EMERGENCY FUND
INTERNATIONAL LABOUR ORGANIZATION
FOOD AND AGRICULTURE ORGANIZATION
INTERNATIONAL CIVIL AVIATION ORGANIZATION
INTERNATIONAL BANK
UNIVERSAL POSTAL UNION
DEPARTMENT OF EDUCATION
DEPARTMENT OF SOCIAL SCIENCES
DEPARTMENT OF CULTURAL ACTIVITIES
DEPARTMENT OF NATURAL SCIENCES
DEPARTMENT OF MASS COMMUNICATIONS
DEPARTMENT OF EXCHANGE OF PERSONS
DEPARTMENT OF RECONSTRUCTION
DIVISION OF SCIENTIFIC ORGANIZATIONS
DIVISION OF FIELD SCIENCE COOPERATION
DIVISION OF GENERAL SCIENTIFIC ACTIVITIES
APPLIED SCIENCE
LATIN AMERICA MONTEVIDEO (URUGUAY) FORMERLY : RIO DE JANEIRO
MIDDLE EAST CAIRO (EGYPT)
SOUTH ASIA DELHI (INDIA)
FAR EAST SHANGHAI (CHINA) FORMERLY : NANKING
BRANCH OFFICE AT MANILA
NATIONAL COMMISSIONS
GOVERNMENT INSTITUTES
REGIONAL OFFICES OR OTHERS SPE-CIALISED AGENCIES OF THE UN
UNIVERSITIES LABORATORIES
INDUSTRIAL LABORATORIES
SCIENTISTS AND TECHNOLOGISTS

had written a memorandum in which he said that Unesco (or UNECO as it then was) should, among other things, "give aid to countries desiring assistance in the development of their cultural and educational institutions and programmes" and "facilitate the free flow of ideas, information and news between the countries". In July 1944, Dr. Joseph Needham, then Director of the Sino-British Science Co-operation Office, wrote a similar memorandum from Chungking in which he said : "What many of us would like to see would be an International Science Co-operation Service, whose representatives in all lands would have diplomatic status (or whatever status was formerly accorded to officials of the League), and full governmental facilities in communication and transportation, but who would be drawn from both government and academic laboratories, and hence would be free from commercial entanglements. One of the immediate aims of such an international service would be the conveyance of the most advanced applied and pure science from the highly industrialized western countries to the less highly industrialized eastern ones, though this is not to say that there would be no scope for westbound traffic too".

This memorandum was entitled "A Memorandum on an International Science Co-operation Service". It was followed by "Measures for the organization of International Co-operation in Science in the Post-War Period" (London, December 1944) and "The Place of Science and International Scientific Co-operation in Post-War Organization", (Chungking, April 1945). Meanwhile, in the U.S.A., Professor R. Field, the geologist, and Professor W.B. Cannon, the physiologist, urged similar ideas in their "Memorandum on Future Plans and Activities of International Scientific Organization", (Washington, Oct. 1944).

UNESCO'S CONSTITUTION AND PLANNING

These ideas found their place in the Constitution of Unesco. The purpose of the organization is defined in Art. I.1 as "to contribute to peace and security by promoting collaboration among the nations through education, science and culture". According to Art II.2 (c) the organization will, to realize this purpose, "maintain, increase and diffuse knowledge... by encouraging co-operation among the nations in all branches of intellectual activity". Section (b) of the same Article speaks of "collaboration among the nations to

advance the idea of equality of educational opportunity without regard to race, sex or any distinctions, economic or social".

In due course, when the work of the Preparatory Commission came to an end, and the programme of organization was settled at the First General Conference in Paris in November 1946, a resolution to set up a series of Field Science Co-operation Offices was adopted. The Secretariat was instructed "to establish a series of Field Science Co-operation Offices starting with those regions of the world remote from the main centres of science and technology, to begin in 1947 with four (East Asia (China), South Asia (India), Middle East and Latin America); each to consist of scientific men engaged in every type of liaison work which will assist the scientists of the region, having special regard to the raising of the standard of life of the non-industrialized peoples".

WHAT IS SCIENTIFIC LIAISON?

Before going further, let us see exactly what these scientific liaison duties are. They may be classified as follows :

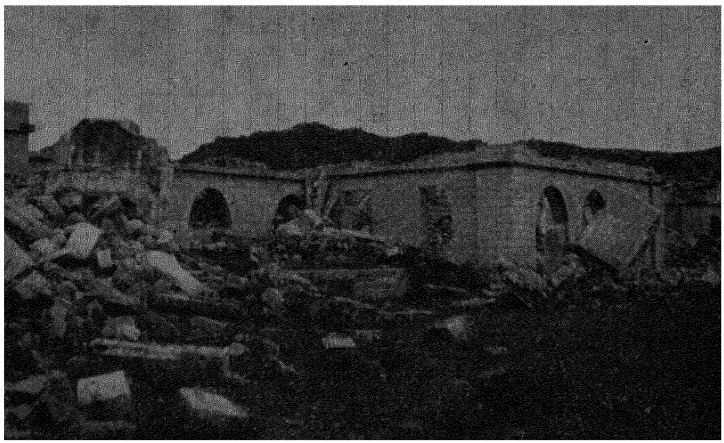
(1) Establishment and maintenance of personal contact with the scientists and technologists of the region in question, and with the institutions — governmental, university, and industrial — in which they work. This naturally involves a considerable amount of travelling, and the liaison officers have to be prepared for the inevitable discomforts and even dangers incident to travel in non-industrialized countries.

(2) Establishment of the liaison office as a clearing-house and information centre for the supply and distribution of

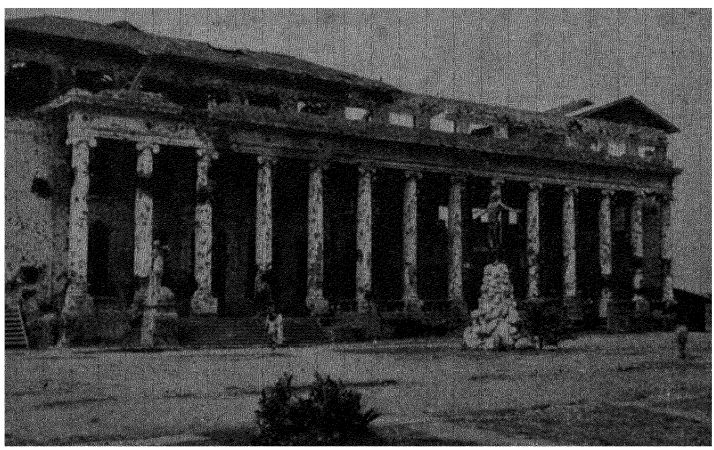
(a) scientific literature, whether in the form of original journals and papers, microfilms and their reading machines, photostats and all kinds of documentation,

(b) essential scientific equipment and materials, ensuring that they reach the proper recipients in the region,

(c) scientific information already existing on problems in the region,



Ruins of part of Amoy University, Amoy, Fukien, China — this building was destroyed during the war to provide granite for Japanese fortifications.



Ruins of the Great Hall of the University of the Philippines, Manila, Philippines.

(d) ideas and suggestions which might be obtained from the centres of science and technology in the advanced countries to meet specific problems in the region.

(3) Facilitation of the outward movement of scientific and technical reports from laboratories and other sources in the region, and its scientific journals, to the main centres of science and technology.

(4) Help in informing the outside world of interesting and important work being carried out in the region.

(5) Arrangements for the exchange of scientific correspondence and manuscripts, scientific papers, articles, and reviews for publication.

(6) Provision of scientific advice, when required, to governments of the region; and co-operation with bilateral scientific missions, scientific attachés, and government service scientists who may be working in the region.

(7) Facilitation of visits, which may be of short duration, by eminent scientists to the region, and encouragement of all plans for international collaboration in research and co-operative expeditions.

(8) Co-operation with, and when necessary, advice to, the other Specialized Agencies of UN.

(9) Assistance to all schemes of personnel exchange across the boundaries of the region.

One might summarize by describing the primary function of Unesco's Field Science Co-operation Offices as one of "facilitation" including the collection, exchange and dissemination of scientific information in a two-way flow, between each particular region and the rest of the world.

How do the liaison officers carry out their work? Technical advice is given immediately wherever possible, but when this is not possible they either write to specialists outside their area for the information required, or pass on the question to the Headquarters Unit at Unesco House, Paris, where the staff endeavour to obtain replies, either by consulting the other members of the scientific secretariat, or by further recourse to outside authorities. Besides the Headquarters Unit of the Field Science Co-operation Offices, Unesco's scientific secretariat includes specialists in Pure, Medical, Agricultural and Engineering Sciences, Scientific Documentation and Apparatus, and the Social Implications of Science and History of Science. At Unesco House, again, the Libraries Division has a wealth of information on book and periodical exchanges between libraries; the

Exchange of Persons Department constitutes the world clearing-house for all internationally available fellowships and studentships; and there are the Departments of Education and Culture. Through the Unesco Office in New-York, microfilms and other forms of documentation, or special samples of chemicals produced in U.S.A. may be obtained. The Headquarters Unit has access to the library of the French *Centre National de la Recherche Scientifique* for reference, and may obtain bibliographies from the *Commission Internationale des Industries Agricoles*. Last but not least, Headquarters Unit can appeal to the secretaries of the various International Scientific Unions, of which mention has already been made, who are in a position to give the most authoritative information on the present state of any particular question, or who can indicate what specialist in what country should be applied to for the information needed.

The various Field Offices maintain contact with one another. This is worth while emphasizing, since, side by side with Unesco's network, the offices of the cultural relations organizations in various countries still provide a most important means of conveying scientific information to enquirers. Thus, during the war, it was the experience of members of the Sino-British Science Co-operation Office that if a Chinese scientist requested some information about scientific work going on in England, it was relatively easy to obtain it for him without delay, but if he made a similar request for the information about Swedish or Venezuelan work, the matter was not so simple, as no regular machinery existed for getting it. This multilateral service is exactly what Unesco's Field Offices are able to provide.

SETTING UP THE SYSTEM

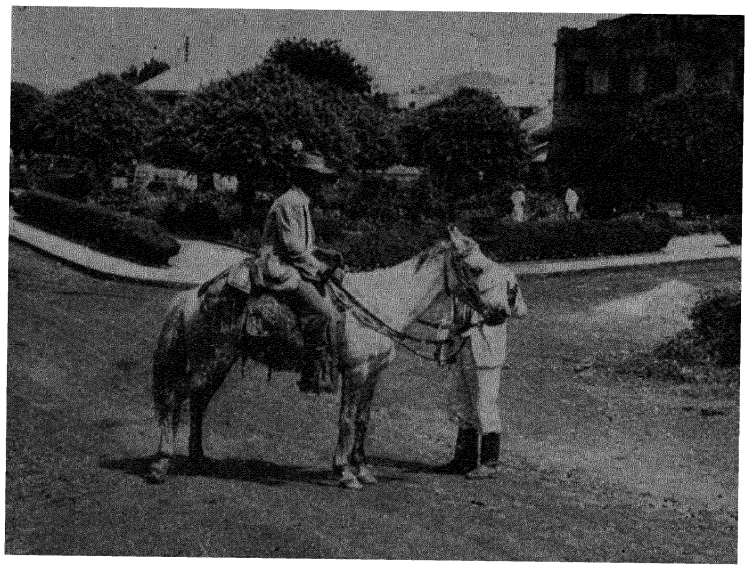
During 1947, scientists were recruited for the Field Offices and sent to their posts. In November of that year the Second General Conference of Unesco assembled at Mexico City. The work so far done was fully approved, and the setting up of a Field Office in South Asia (India) which had not so far proved possible owing to financial limitations, was again endorsed. In Resolution 6.1.1. the Director-General was instructed " to maintain Field Science Co-operation Offices in the Middle East, the Far East, and Latin America, and to establish an Office in South Asia in 1948, as

undertakings of the highest priority within the Natural Sciences programme".

November 1948 saw Unesco's Third General Conference at Beirut. In his Report, the retiring Director-General, Dr. Julian Huxley, said: "The Field Science Co-operation Offices are another extremely important element in Unesco's scientific programme... The principle of regional field offices for the natural sciences has fully justified itself, and is beginning to yield valuable results in raising the level of scientific activity in the regions concerned, as well as setting a pattern for field operations in other domains". A resolution (3.1) couched in the same terms as that of the preceding year, authorized the development of the system, adding: "in the development of this work during 1949 it is recommended that it should concentrate on the exchange and supply of information, material and personnel". All these facts suffice to show that the network of scientific liaison offices has become an established part of Unesco's work for the vast "outlying areas of the world".

Let us now pass on, from these more official aspects, to describe a typical day in the life of the scientific liaison officers at their posts. Before doing so, it will be well to say a word on the typical staffing of the offices. Each office is headed by a Principal Field Science Officer, seconded by a Field Science Officer; both of these must be scientists from countries outside the area in question. Working with them are one or more Assistant Field Science Officers, who are normally nationals of one of other of the countries which the region comprises. This is particularly necessary where there are language difficulties, as for example, in China, but it is valuable everywhere since it makes the scientists of the region rightly feel that they are partners in a co-operative enterprise, and not an underprivileged group being "worked amongst". In addition, scientists may be attached to the offices in a voluntary capacity for particular periods.

The Latin American Office started operations at Rio de Janeiro, in the buildings of the National Museum, with a British tropical botanist and a Greek parasitologist, with whom a Brazilian zoologist was associated. The group, which has now moved to Montevideo in Uruguay, is today headed by a Spanish (Republican) biochemist, assisted by an Italian physicist. (At the other end of the world, in Nanking, China, the burden was for long borne by a Czechoslovak engineer and a Chinese industrial welfare specialist. He is now associated with an Australian Biochemist. In India, at Delhi, a Hungarian experimental biologist takes charge, assisted by a Chinese plant physiologist and an Indian chemist. In the Middle East, at Cairo, the Chief is a Belgian agricultural chemist, seconded by a Norwegian mathematician...)



Outside the famous Institute of Tropical Pathology and Hygiene. at Bambui, Brazil.

THE SCIENCE CO-OPERATION OFFICE IN LATIN AMERICA

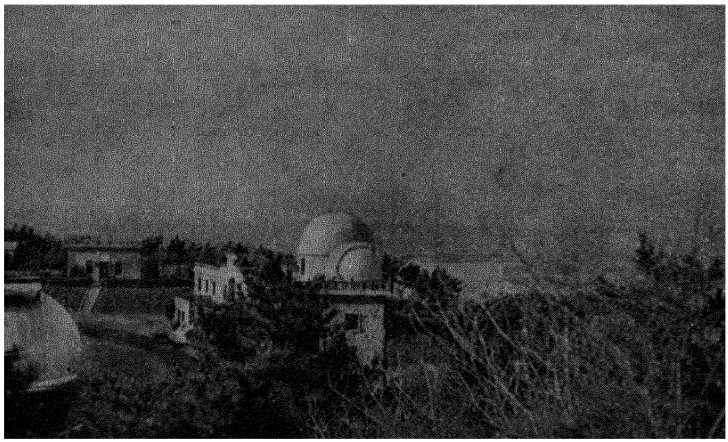
To make the picture a living one, let us now follow the daily work of the field science liaison officer in the Latin American Office.

Opening his morning mail at Montevideo, our liaison scientist finds a difficult problem concerning the effect of X-ray radiation upon cells. What types of equipment are the best, it is asked, and where are there suitable university courses to which young South American technologists could be sent? Next comes a request from Peru that the Office help to organize a mobile museum for science popularization. This reminds him of the urgent need to write to Paris about the summoning by the Peruvian Government of the Symposium on Biology at High Altitudes, to be held at Lima. Another letter brings interesting news of the rôle of auxins (plant growth hormones) in relation to termite colonies. And he is glad to learn that, through Unesco's good offices, two more Latin American countries have decided to adhere to the International Union of Chemistry.

After dealing with correspondence and various routine matters, the rest of his morning may be spent in visiting a biological institute where trypanosome diseases are studied. Here, one research worker wants particulars of a new dark-ground illumination device; another explains his desire to travel abroad working on the most up-to-date electron microscope technique. A third has several times written to obtain histological reprints from Thailand, where another institute is doing relevant work, but has not been able to get a reply, perhaps because of a wrong address.

In the afternoon the liaison officer may receive a visit from plant breeders who are interested in low-temperature-resistant soybeans which might be helpful for the cold-climate economy of the far south of Chile, and who wonder whether some species developed in the colder northern provinces of China might not be obtainable. Remembering that the insect which saved Australia from the prickly pear menace was brought from Mexico, the liaison scientist promises to do his best, and advises parallel consultations with the sister-agency, FAO. This, he thinks, will be a case for contact with the East Asia Office — and at the same time he will also ask for references and information about sugar-cane physiology which another enquirer had wanted. Two copies will be sufficient, one for the Headquarters' Unit and one for his own files.

In the evening the officer and his physicist colleague must go out to attend a meeting of the Uruguayan Association for the Advancement of Science, where, they both will speak and join in the



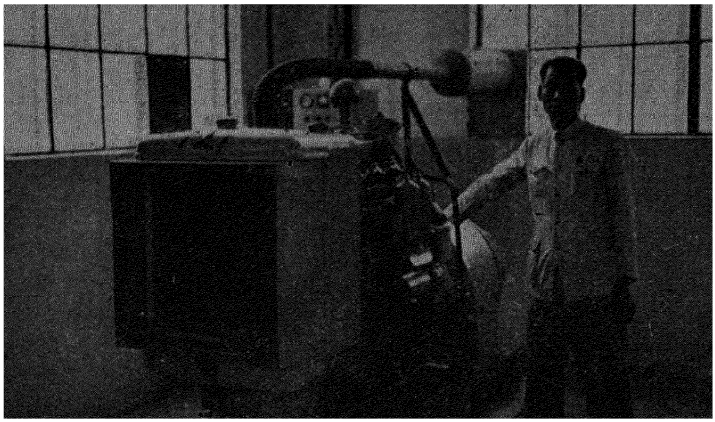
Astronomical Observatory of the National Academy, Purple Mountain, Nanking, China.

discussions : it will be a good opportunity to meet some of the local scientists with whom they have not yet got acquainted. And so on, day after day of activities profitable, not to a single family or state but to mankind.

THE SCIENCE CO-OPERATION OFFICE IN EAST ASIA

Let us now transport ourselves in imagination to the other end of the world : to Nanking in China... The morning's news has already been worrying. The price of food rocketed further yesterday. That means increased pay for the local staff for the next pay period. Yet the official rate of exchange of U.S. dollars to Chinese Gold Yuan remains unaltered...

The days' first job may be a visit to the fine buildings of the National Geological Survey which were fortunately practically undamaged during the Japanese occupation. Here, the liaison officer is welcomed by the Director, who with his staff is delighted with the PFSO's news that a complete file of a certain important geological journal, which the Japanese had removed or burned — some 150 volumes — has been presented to the Chinese Geological Survey by the University of Pretoria, South Africa, where an unwanted duplicate set had been found. This exchange had been arranged by the Libraries Exchange Department of Unesco in Paris. After doing business with several members of the staff the liaison officer leaves for the Ministry of Education to discuss the final arrangements for delivery of the Unesco Gift Book Coupons These are of great use to the recipient institutions : — Book Coupons are like a chequebook, and permit the rapid purchase of any book from a hard-currency country by individuals or institutions in soft-currency countries, the subsequent clearing-house operations being carried out by Unesco's Secretariat. After seeing in a nearby institution the new machine for cutting serial rock-sections, the delivery of which had been accelerated by Unesco's intervention, the PFSO returns to his office. Correspondence, requests, enquiries — some of them fairly simple — for example, the Nhatrang Oceanographic Institute in Indochina, recently contacted, had requested help in securing the exchange of all kinds of documentation and of marine specimens. Paris Headquarters would probably arrange to have this request of exchange published by the *Unesco Bulletin for Libraries* and popular scientific publications such as *Science*



Machinery installed in the Engineering College of Chungshan University, Canton, China, under the UNRRA / Unesco engineering education programme.

News Letter. In the meantime, Canton was clamouring about citrus disease, which was really a job for FAO, and Fukien would like to try out the "carob bean" and legume trees from Sicily.

Then there had been a question about certain strains of micro-organisms. Dr. Yin of the National Peiping University and scientists from several other institutions had wanted several strains of sulphur bacteria, yeasts and algae, for urgent research. Formerly, it would have been hard to know just where to apply, but now, owing to the initiative of the International Association of Microbiologists and its International Centre of Type-Culture Collections at Lausanne, helped financially by Unesco, it was relatively easy to ascertain by cable where they could be obtained. In due course the sulphur bacteria were winging their way by Pan-American from the west coast of California, the yeasts were coming by KLM from Delft in Holland, and the algae, carefully sub-cultured in Prague, were on their way also.

Well, as we have to write to the Middle East Office, let's see what things we urgently need to contact them about? Soil conservation in relation to desert agriculture; here's the enquiry from the Commissioner of Reconstruction of Ninghsia province — mostly desert itself, the Gobi, of course — several pages of enquiries enclosed. Then as to sub-tropical crops, especially nut trees like the avocado pear, could the Egyptians be asked to give us their experiences with these under good irrigation conditions, and if possible to send viable roots, seeds or cuttings for trial?

While on this job, we might contact the Latin American Office too. Chinese agriculturists are very interested in the "babasu" oil plant, and would like specimens of different varieties for trial. Kuangsi Agricultural Experiment Station wants to experiment with the Hawaii horse-bean. Then there is the orobanche disease problem. That will keep Montevideo busy for a while.

As for Paris, we want much fuller information on the best means of improving glass technology in China. In Szechuan and other western provinces, such as Kweichow, government enterprise has set up several plants, but the quality of the products are not yet satisfactory. Suggest contacting the Glass Technology Research Association in England and the corresponding body in the U.S.A. The same with low-temperature lignite carbonization; Yunnan has a potentially very large plant, but the technical difficulties are considerable. There's reason to think that the Czechs could help us here, and the Swedes should also be approached. Early wheat varieties have been asked for from Italy.

As regards that problem of the best utilization of bamboo-pulp for paper-making, and the samples of millet varieties, we are duly contacting Delhi.

Entrance of Fuad Ist University, Cairo.

The PFSO and the FSO at Cairo are glad to receive these enquiries from East Asia. Another letter comes from the South Asia Office : — Could we have (copies duly sent to WHO) the details of the cholera broth-vaccine preparation method which you got from the U.S.A. during the recent Egyptian epidemic? What can you let us have on the active principles of the drug plants *Ammi visnaga* and *Ammi majus*? Meantime, they have been completing the additions to the manuscript for the printing of the third edition of the List of Scientific Papers published in the Middle East. They have been following up a very great variety of questions : — cold-resistant wheat and heat-resistant beet, rubber crop plants for Persia, fixation of sand dunes for Egypt, deep-sea thermometers for the Iraqi fisheries service, bibliographies for scientific libraries in Turkey, the Egyptian enquiry about large-scale X-ray sets for the veterinary care of camels, the needs of people working on trematodes and vitamins at Damascus, the external contacts of Egyptian aphidiologists. Just now Egyptian engineers are very busy with the coming World Engineering Conference in Cairo ; all the Field Officers are transmitting reports of interest to engineers in their regions on the world organization of engineers.

In the afternoon, before starting out on a visit to some interesting laboratories, a telegram comes from Paris announcing the arrival of a member of the Department of Reconstruction who will look in for consultations. Then there is the Director-General's party arriving in a few days' time. The visit will undoubtedly be highly profitable and will help to spread the work of Unesco ; nevertheless, it means several days diversion from the normal activity of scientific liaison.

At tea (or rather coffer, thick and sweet after the manner of the Middle East) scientists from the famous University of Beirut in the Lebanon are entertained, anxious to talk about their problems.

The day ends with a discussion on how to compile bibliographical data on the utilization of solar energy, of which such unlimited quantities go daily to waste over the ground surface of the African continent. Next day the FSO will be flying to Teheran to visit the university and certain industrial laboratories just opened.

Cobras (kept in captivity for making anti-venom serum) at the Pasteur Institute, Bangkok, Siam.

The only one of the Field Offices which we have not yet taken a glimpse of is Delhi. It is housed in the university buildings, and the sun coming in through the corridor windows is a good deal more powerful than in Cairo. Electric fans are a necessity, not a luxury, and the brass paper-weights which one has to use to hold everything down with while one is working, are an additional irritation in the heat. But the Beauty of Hymayun's Tomb not far away and the Pillar of Asoka on its leafy ruin in the gardens, are compensations. Constantly on the move, visiting Bangkok in Thailand, Singapore or Kuala Lumpur in Malaya, Karachi in Pakistan, or Madras or Bangalore in India, the liaison scientists are always glad to return to their base at Delhi. Their days are like those which we have been describing for the other Field Offices. They have the fullest co-operation from Indian scientists, whether in the Government laboratories of the Council for Scientific and Industrial Research, or in the great universities of Calcutta or Bombay, or in the centres of advanced pure research such as the Indian Institute of Science at Bangalore. Lately they have had some difficult problems such as the question of help for the partitioned university of Lahore, which split after the separation of Pakistan from India, the Pakistani portion staying and the Indian portion moving to temporary quarters at Simla and a number of other places.

Modern India is keen to forge ahead with big public works as quickly as possible, so it is not surprising that there are enquiries about modern hydro-electric plants such as those of Shannon in Eire and the Tennessee Valley in the U.S.A. It is extraordinary how apparently unrelated branches of science are tied up together. In such work the central constructive effort of the engineers touches geology at one point and agricultural matters at another : — 'I must remember to put through those enquiries from the Compost Development Officer about the effects of manure and fertilizers on soil productivity'. Meteorology also comes into it, as dealing with probable rainfall and water supply. This will be where that High Altitude Station on the Himalayas will come in, with important practical results. And in all these fields there is a thirst for literature — we are importuning Paris for publications on every conceivable scientific subject. Moreover, we are seeing that Indian publications circulate; how interesting it was to have an enquiry on Indian nitrogen-fixation work from Cyprus a week or two ago. Truly no part of the world is an island unto itself; all partake of the basic human needs which need science and its applications for their satisfaction.

THE HEADQUARTERS IN PARIS

Last of all, there is still one place we have not yet visited, the Headquarters Unit in Unesco House in Paris. Here, requests coming in from all the offices are recorded, indexed and answered wherever feasible. Frequently, this is not immediately possible and the enquiry is passed on to one of the other members of the Natural Sciences Department or to scientists outside Unesco.

One cannot help feeling that something has been started here which is bound to grow, and which, however much circumstances may change, the world will never again be able to do without.

WHAT THE FIELD LIAISON SCIENTIST SEES

The field liaison scientist is often privileged to see aspects of life very different from those of European civilization. When, for example, he pays a visit to the town of Kuanhsien in Szechuan, one of the western provinces of China, he finds that the Min River, coming out of the foothills of the Tibetan mountains, is diverted through a cut into a vast irrigation system which fertilizes the whole of the Chengtu basin. This was conceived and carried out by Li Ping, the governor of the province, as far back as 270 B.C.; although modern improvements have been made — the hydraulic engineers of the Min River Conservancy have the best modern training — and a big hydro-electric plant is planned. With their genius for synthesizing the romantic and the rational, the Chinese people canonized Li Ping and his son Li Erh-Lang, who completed the works after his death. So the visiting field liaison scientist finds two beautiful temples beside the canals, dedicated to these heroic engineers of two thousand years ago; incense sticks are burning before their images, and Taoist priests are carrying on liturgical observances and looking after the buildings.

So also in India, where in a religious climate very different from that of the practical Chinese, the Unesco field science liaison officers attended not long ago the Puja celebrations at the Indian Institute of Science at Bangalore in Mysore. The traditional Puja festival is celebrated in slightly different ways in various parts

Machinery at the Indian Institute of Science, Bangalore, India, garlanded for the Puja celebrations.

of India ; in Mysore it is primarily a festival of the tools, instruments and apparatus which people use in their daily work. These are decorated with garlands, and prayers are said for their successful use. In the laboratories, workshops, and library of the Institute, the tools thus decorated were modern scientific equipment, microscopes, chemical apparatus, precision balances, books on atomic energy, etc. It was an inspiring sight to see ancient traditions combined with modern science, achieving the continuity of civilization without conflict.

The liaison scientists soon become aware of the pertinacity and the spiritual strength of the scientists and technologists of the underdeveloped countries. There are, of course, in those countries certain great centres such as Peiping or Shanghai in China, or Calcutta or Bombay in India, where the intellectual atmosphere is not so different from the great centres of science and industry in Western Europe and North America ; as there are western scientists who find themselves in isolated places, such as the forestry commissioners in Malaya, or the entomologists working in Central Africa.

But the position is not quite analogous. Even in the greatest centres of learning in the underdeveloped countries, though a man may find the necessary stimulus of conversation with other experts in his own field, the standard of laboratory equipment and library facilities is much lower than in the corresponding great centres in the fortunate western countries. Existing apparatus is inadequate or worn-out and there are totally insufficient funds for purchasing up-to-date enquipment. When we come to the really isolated places, there is an enormous difference. A European scientist in the middle of Africa is based upon well-equipped laboratories in his home country, and has all the ressources of the most elaborate libraries and documentation services of his country to fall back upon. He is protected by the best medical supplies and often carries the most modern apparatus with him. Far otherwise is it with the scientist of an underdeveloped country who is carrying the standard of human welfare into a remote region. During the war, when staff-members of the SBSCO visited a plant for the dry distillation of wood on the borders of Tibet, they found that the two Chinese engineers, both trained at the Massachusetts Institute of Technology, though without previous experience in this particular field, had constructed the entire factory from drawings in an old textbook, with a complete lack of blueprints or other technical aid. The factory was not perhaps as efficiently planned or operated as it would have been under more favourable conditions, but it had arisen straight out of the age-old rice-fields, and the miracle was that its yield (which was considerable) was as good as it was.

So also with the plant in Fukien for the production of petrol from pinewood stumps. The entire plant was a marvel of improvization; it used old rejected boilers from the Fuchow Navy Yard, bamboo piping, and the scrubbing-towers and general containers were all constructed from broken-up steel petrol-drums. Few people realized that old petrol-drums were the source of steel for the casings of the excellent radio sets and signal beacons turned out by the National Resources Commission factories at Kweilin.

When a power-station engineer stood at the door of a power-house somewhere on the threshold of Central Asia, and reminded his guest that there was no further plant west of that point until one came to Russia, two degrees of longtitude west and two degrees latitude north, he was only too well aware that he had to look after himself; there was no well-equipped central Grid Corporation to look after him with spare parts or other supplies, even if communications would have enabled them to reach him.

The story will never fully be told of the work of the pioneers of science and technology in the remoter regions of the earth, of their unremitting efforts for the welfare of mankind, their incredibly ingenious improvizations, their years of loneliness and, of some, their lonely illness and death. Western scientists who go out into the field experience some of these things, but those who really bear the brunt are the scientists and technical men of the underdeveloped countries who go out cheerfully into the wilderness from a base which is itself often hopelessly inadequate.

STIMULATING THE SETTING-UP OF REGIONAL RESEARCH INSTITUTES

We now leave our imaginative reconstruction of days in the lives of Unesco's Field Science Co-operation Officers, to look at certain particular problems which have loomed large in the work of certain of the Field Offices during the past two years.

An organization known as the International Council for the Exploration of the Sea, which has its headquarters and laboratory in the old castle of Charlottenlund, on the Baltic, is typical of what are called "inter-governmental organizations"; that is, bodies which are set up by diplomatic conventions and supported entirely by public funds from their Member States. In this they closely resemble the Specialized Agencies of the United Nations, the difference being that they are usually much smaller and work in more

highly specialized fields. They differ basically from the International Scientific Unions of which we spoke above, since the latter are primarily "non-governmental"; i.e. their constitutions are not diplomatically registered and their funds do not derive from public sources. The International Council for the Exploration of the Sea has a regional character, and one of Unesco's earliest aims was to promote the further formation of research bodies of a regional inter-governmental character.

The first great project concerned that vast area of tropical equatorial forest which forms the basin of the Amazon River; the preparatory moves for the formation of the International Institute of the Hylean Amazon took up a great deal of the time of the Unesco field liaison scientists in South America. The proposal, which goes back to May 1946, was originally a Brazilian one. — At the First General Conference (Paris, November 1946), the Director-General was instructed to "explore the possibilities of the foundation of new international scientific laboratories and observatories... including an institute of tropical life and resources in the Amazon Basin". By the time of the Second General Conference (Mexico City, November 1947) matters had advanced: the Director-General was instructed "to take steps to bring into being in 1948 in International Institute of the Hylean Amazon" and to that end "to call forthwith a meeting of its Council, consisting of representatives of the nations and international organizations named in the report of the meeting of the Belem Commission in 1947, together with representatives of any other country or international organization which may express itself as interested". Unesco's rôle in the whole matter, it was laid down, was to be initiatory and stimulatory. The Director-General was to consult with interested governments and organizations concerning the future financing and administration of the Institute, and to present recommendations to the Third General Conference.

In the following April and May, the Conference for the creation of the International Institute, called jointly by Unesco and the Governments of Peru and Brazil, met at Iquitos, Peru. It agreed upon the diplomatic convention establishing the Institute to come into force upon acceptance by five of the signatory nations. An Interim Commission was set up with its Headquarters at Manoas, Brazil. The nations which thus joined to found the new research centre were Bolivia, Brazil, Colombia, Ecuador, France (on account of French Guiana), Holland (Dutch Guiana), Peru and Venezuela. An annual budget of $306,000 was agreed upon.

Since the first discovery of Amazonia, it has been explored by scientific missions from many different countries, but the work has always lacked a permanent centre to co-ordinate research, to

follow it up systematically, and conserve the results for future generations. The area offers almost limitless scope for research and for improvements and development. In agriculture, the old and primitive methods of making temporary clearings by fire, and of planting seeds in the wet river-bank soil, have to be replaced by modern methods. In botany, a diversity of species much greater than that of Old World forests, offers striking opportunities for timber research; there is a wealth of plants which are likely to yield products valuable for pharmacy and industrial chemistry; in geology and mineralogy, there are equally attractive possibilities. In meteorology, studies of tropical rainfall and cloud conditions present themselves — important, among other things, for better and safer air travel across the hundreds of miles of almost impassable forest. Last but not least, the anthropology of the peoples of the area calls for study.

Already bibliographical surveys have been completed and a team of six senior specialists and ten assistants has spent some time surveying the Rio Huallaga Valley on the Peruvian side of the border.* It is expected that once the research institute is firmly in being, it will not only send out scientific survey parties itself, but will also be able to act as a centre for exploration teams sent out by universities and by botanical, zoological and anthropological societies all over the world.

Regional international research institutes are indeed one of the most interesting coming forms of world collaboration. At the Third General Conference of Unesco at Beirut in the Lebanon, the interest of the Middle Eastern countries was awakened by a similar proposal for an International Institute of the Arid Zone. This would concern itself with the physics of soil erosion in desert areas, with agricultural and horticultural problems on the borders of deserts, desert sources of water and their utilization, solar energy equipment, and every kind of problems common to all peoples who live in, or at the edges of, deserts. Countries such as China, Australia and South Africa may well desire to contribute to an International Research Institute of the Arid Zone, in view of their own desert problems. If and when practical steps are taken to bring such an Institute into being, the field liaison scientists of the Middle East Office will have the same mass of work on their hands as their colleagues in Latin America, and they will have to be reinforced from Paris in the same way.

The whole question of international laboratories is meanwhile under study by the United Nations, especially by its Economic and Social Council.

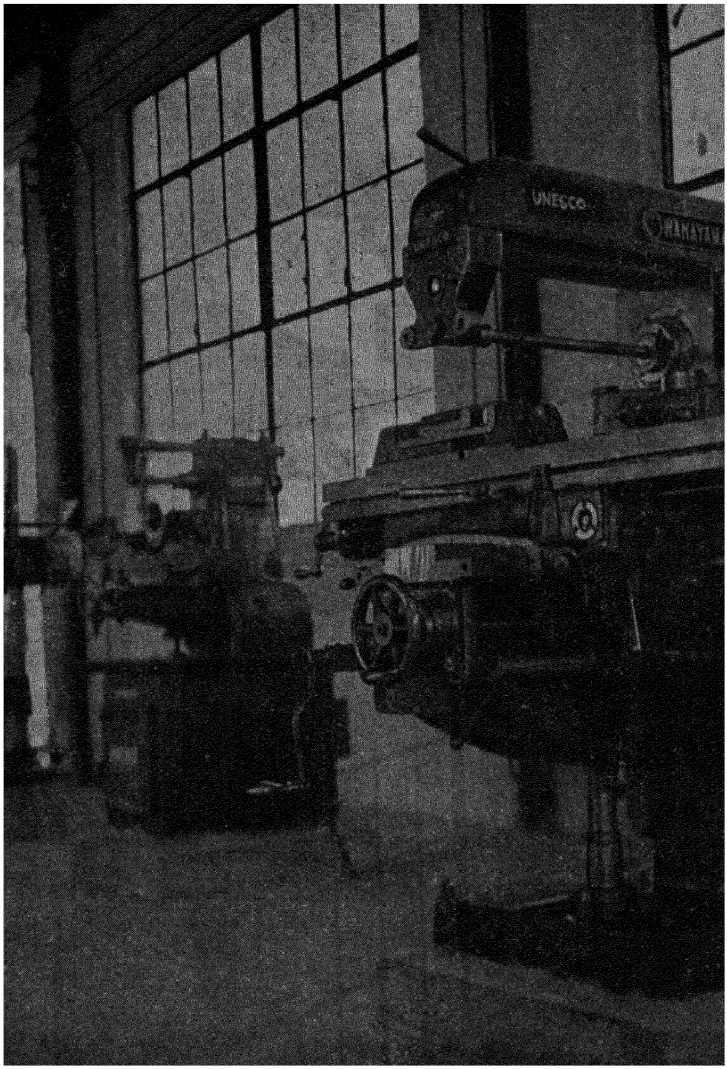
* This survey was carried out under the joint sponsorship of Unesco and the Government of Peru.

ASSISTING IN SCIENTIFIC RECONSTRUCTION

We now turn to a quite different Unesco activity, scientific reconstruction — an enormous problem which would demand a booklet to itself. Here it only enters into the picture because — just as the Latin American Field Science Co-operation Office during its first eighteen months was occupied with the setting up of an international research institute — so the East Asia Field Science Co-operation Office inherited from UNRRA an almost equally large task in reconstruction.

The United Nations Relief and Rehabilitation Administration had initiated a programme for helping engineering education in China, small indeed in comparison with UNRRA's other undertakings, but large in relation to funds for engineering college equipment normally available in underdeveloped countries. The programme involved the purchase of $ 2,000,000 worth of machinery for engineering teaching and its despatch to China; the bulk amounted to some 720 tons, and by November 1947, at which date the programme was turned over to Unesco for completion, about 85 per cent of the equipment had already reached China. Allocations were made to about 35 Chinese Universities and technical colleges, among them some very well-known ones, such as Tangshan College, and other institutions depending on the Ministry of Communications, which had trained several generations of Chinese engineers. The average value of the equipment allotted to each college was some $70,000; not infrequently this amounted to three or four times the value of the total equipment previously in use. It was at the Mexico City General Conference that the request came to Unesco from UNRRA to complete the programme and fortunately the Acting FFSO who had been appointed to start the East Asia Office was himself an engineer. During 1948, the distribution steadily proceeded; the expenses of installation were met from other UNRRA funds remaining in the country. By August 1948, 370 tons had been despatched to the recipient colleges, and by February 1949 only 130 tons had not been distributed. The politically disturbed state of the country was by now interfering with the programme, and some 80 tons have been stored temporarily in Taiwan (Formosa). But these quantities are only small remainders, less than 15 per cent of the whole.

Great credit is due to the Field Officers of Unesco both in Latin America and East Asia for handling such heavy responsibilities almost single-handed, over and above the normal burden of the work of a Field Science Co-operation Office.



Machinery installed in the Engineering College of Chungshan University, Canton, China, under the UNRRA / Unesco engineering education programme.

CORRELATION OF FIELD ACTIVITIES

It remains to add a few words about the parallel activities of other parts of Unesco and of the other Specialized Agencies. In the cultural field the need for "regional offices" has not appeared so urgent, but a desire for them has been expressed by representatives of Central America, the Middle East and South and South East Asia; it is not yet clear how these developments will proceed. As to the other Specialized Agencies, both WHO and FAO maintain regional offices; the former's at Singapore has a long history going back to the predecessor of WHO, the League's Health Service. Every effort is made to ensure close co-operation between the field liaison scientists of Unesco and the technical experts working in these other regional offices. One aspect of this collaboration is the attendance of Unesco's liaison officers as observers at meetings called in or near their respective regions by other Specialized Agencies of the UN. Thus, in recent months, the Middle East Office covered the Regional Conferences of FAO and WHO at Cairo, the Latin American Office covered the FAO Forestry Conference at Teresopolis, and the East Asia Office joined with representatives of the Paris Headquarters in attending FAO Conferences on Nutrition, Rice Genetics, and Fisheries problems at Baguio in the Philippines and at Singapore (See Appendix III).

Among their multifarious activities the field liaison scientists may be called upon to organize important conferences within their region. A recent example was the Conference on the Development of Science, in Latin America, held at Montevideo, Uruguay, in September 1948. This conference, which united important scientific representatives from all the Latin American countries, proved of great value, and important decisions were taken for the future scientific work in that continent.

ALL AID TO SCIENTISTS AND TECHNOLOGISTS IN THE "FRONT LINE"

To sum up, we may say that the conception of the network of Field Science Co-operation Offices is precisely in line with the intentions of the founders of Unesco. Science had to be included in the organization because it affords perhaps the most striking example of the unity of humanity, and also because the understanding of the

world of nature alone permits its control, and hence the raising of the standard of life of millions of our fellowmen in those far-flung countries which, perhaps by a series of historical accidents, have remained underdeveloped. In the building of a better world, the fostering of culture without science and technology would become a mockery; and the attempt to spread education without spreading decent minimum standards of freedom from disease and malnutrition would only lead to a discontent worse, and more justified, than before.

Hence the watchword, All Aid to the Scientists and Technologists in the Front Line! While not neglecting the due provision of facilities for the men in the great centres of science and technology to meet together, to publish, and to work for the advancement of knowledge, help must urgently be sent to the less favoured areas. Whether it is a Chinese engineer building a bridge on the borders of Mongolia, or a Haitian entomologist studying insect carriers of disease through the microscope in a tropical grass hut, or an Arabic successor of al-Razi teaching chemistry to young Iraquis, these are the men who stand at the invisible focal points of the advance of civilization. These are the men who need, and most fully deserve, all possible help. The International Science Co-operation Service which earlier scientists hoped for, is now in being — let it not fail for lack of means.

APPENDIX I

ACTIVITIES OF THE OFFICES

As an example of the activity of the offices, selected lists are given, on the following pages (appendix II) of enquiries on specific scientific problems, received by the FSCO's.

This service is, however, only one part of the work of the offices. Other main activities are as follows :

1. Facilitation of contacts and the exchange of scientific specimens and publications throughout the world, often with the collaboration of Unesco's *Bulletin for Libraries* and science publications.
2. Supplying rare literature in such forms as reprints, microfilms. (The Middle East Science Office alone has distributed over 100 memoirs and photostats.)
3. Assistance to the calling of regional scientific conferences.
4. Encouragement of formation of new scientific societies and unions.
5. Dissemination of information on the International Council of Scientific Unions, on other international scientific bodies and scientific organizations in different countries.
6. Preparation of lists of scientists, scientific institutions and scientific publications of the regions. (The list *Scientific Publications in the Middle East*, has gone into its third edition.)
7. Distribution of *Fiat Reviews on German Science* (physics, chemistry, mathematics, medicine, biology, science of the earth — over some fifty volumes and other publications on German and Japanese Science during the war.
8. Assistance in carrying out other Unesco projects, e.g. Exchange of Persons and the Book Coupon System, and supplying information on other Unesco activities, e.g., to Indian Adult Education Association.

APPENDIX II

SCIENTIFIC REQUESTS RECEIVED

About 10 per cent of the enquiries are of such a nature that our present facilities are inadequate to give competent help; about 35 per cent are in the process of being completed and the remaining 55 per cent have been satisfactorily dealt with.

The signs (1) (2) (3) and (4) indicate that the same question was also sent to other Field Offices for information : (1) Latin America ; (2) Middle East; (3) East Asia; and (4) South Asia.

Although a subject for which liaison assistance is requested, may be summarized in these tables in a very short phrase, it may, in fact, have entailed many weeks or months of work, especially if, as is frequently the case, the range of contacts desired and the scope of the enquiry set en foot is considerable.

(1) LATIN AMERICAN OFFICE

ARGENTINE

Photocopies and microfilms on mathematics.

BOLIVIA

Obtaining samples of " United Hybrid " seeds.

BRAZIL

Arrangements for despatch of specimens of Indian cattle (4).
References on Betatron.
Working drawings for Geiger-Muller counters.

COLOMBIA

Information on geography congresses.

CHILE

Request for collaboration of the FSCO for the organization of the Latin American congress on Marine Biology.

EQUADOR

Activities of the Hylean Amazon Institute.
Information on experiments on cosmic ray showers.
References on geography.
Contact with Uruguayan palaeontologists.

GUATEMALA

Plans for medical studies in different countries of Europe and Latin America.

MEXICO

Information about the Congress of the Argentine Association of Physics.

URUGUAY

Publication of a Latin American scientific encyclopaedia.
Information about the teaching of science in schools.
Up-to-date science news.
References on mathematics.
Addresses of Japanese and German post-war journals of mathematics.
Information about the installation of physics apparatus.
Technical details on Geiger Counters for beta rays.
Information on measurements of radio-activity and sources of neutrons.
References to works on radio-biology.
References on genetics.
References on bacteriology.
Fungi specimens and lists of mycological cultures (3) (4).
Information supplied from Indian scientists about *madura mycosis* (4).
References on the utilization of auxins in the development of termites.
References supplied of works on the mosquito.
Request that Professor Hauduroy of Lausanne should lecture at Montevideo.
Organization of the first Latin American Congress of Psychology.
Reports of medical authorities in the Middle East (2).
Information on injection treatment for spider bites.
Working drawings for plant for manufacturing Geiger-Muller counters.
Working drawings for high tension D.C. supply.
Varieties of soybean specimens.
Bilbiographies on soybean production and on soybean as a food.
Selection of seeds of maize, type " Hybrid ".
Addresses of breeders of " Plymouth Rock White " fowls.
Information on scientific museums.
Investigation of the possibility of Spanish versions of scientific films.
Information on Canadian and Polish Scientific films.
References on History of Science.
The teaching of History of Science.
Requests for a fellowship transmitted to the IUBS.

ENQUIRIES FROM COUNTRIES OUTSIDE THE REGION

GREAT BRITAIN

Information on societies for the advancement of science.
Report on the cultivation of the sunflower.

SOUTH AFRICA.

Information on sway-back disease of lambs.

THE FOREGOING REQUEST EMANATED FROM THE FOLLOWING INSTITUTIONS

ARGENTINE

Facultad de Ciencias Exactas, Fisicas y Naturales, Buenos-Aires.

BOLIVIA

Universidad " Simon Bolivar ", Cochalamba.

BRAZIL

Instituto Agronómico da Norte-Belem-Pará.
Univ. de Sao Paulo.

COLOMBIA

Contralor Gral. de la Republica.

CHILI

Estación de Biologia Marina de Viña del Mar, Chili.

ECUADOR.

Escuela Politecnica Nacional, Quito.
Dr. Marcos Bustamente.

GUATEMALA

Facultad de Ciencias Y Farmacia de Guatemala.

MEXICO

Comisión Impulsora y Coordinadora de la Investigación Cientifica.

URUGUAY

Centre de Estudios Psicológicos.
Comisión Cultural — Municipalidad Montevideo.
Facultad de Humanidades y Ciencias, Montevideo
Facultad de Ingenieria, Montevideo.
Facultad de Medicina, Montevideo.
Instituto de Ciencias Biológicas, Montevideo.
Instituto Fitotécnico y Semillero Nacional, La Estanzuela, Colonia.
Instituto de Higiene de Montevideo.
Instituto de Radiologia, Montevideo.
Radio Espectador, Montevideo.

(2) MIDDLE EAST OFFICE

CYPRUS

Information on non-symbiotic bacterial fixation of nitrogen in soil, in particular, on photo-synthesis of nitrogenous compounds (4).
Information on cold-resistant wheat seed varieties.

EGYPT

Information on the structure of centralized institutions for scientific research.
Information on the purchase of scientific equipment, e.g., veterinary X-ray unit, refrigerating equipment, electron microscope, etc.
Help to obtain quick delivery of galvanometers.
Bibliographical data on the biological effects of supersonic waves.
Information about recent work on the utilization of solar energy.
References on semi-conductors.
Help to obtain certain reagents and research chemicals in small quantities.
Help to obtain a culture of *Salmonella choleraesuis* and of the virus of cholera in swine.
Bibliographical data on the substitutes of *acacia.*
Addresses of institutes where specimens of *acacia* can be obtained.

Help to secure a specialist for the determination of mammiferous bone-structure.
Bibliography on *Bilharsiosis*.
Text of an unpublished article on the detection of cholera germs.
Help to obtain cultures of *Leishmania tropica* and *Bacillus subtilis*.
Information on recent works on amoebic dysentery.
Bibliographical data on Newcastle disease (L).
Documentation on the anatomy and pathology of camels.
Bibliographical study on the transformation and conservation of vitamins in the animal body.
References on psychotherapy and information on centres for psychotherapy and mental hygiene.
Information on various institutes for the study of public opinion and on the methods applied .
Information on bleaching of paper.
Bibliographical data on glass technology.
Advice as to how and where technicians can study optical industry work.
Samples of seeds of Vicia faba, resistant to fungal diseases (1) (3).
Samples of seeds of rice and wheat of certain categories (3).
References on sugar-cane breeding stations in Latin American (1).
Articles and microfilms on the physiology of sugar-cane and the characteristics of the different varieties of sugar-cane (1) (3).
Documentation on the fixation of sand dunes.
Information on the results of recent research works on various plant diseases (1) (3).
List of selected important institutions doing research work in phytopathology.
Information on the acclimatization of cattle in tropical regions (4).
Help to obtain transportation grants, with positive results for two enquirers.

IRAN

Information on the activity of two tobacco research institutes.
Information on equipment for the air-conditioning of laboratories.
Bibliographic information on rubber plants and on the technology of rubber.
Help to obtain means of detecting *Aphididae*, *hymenopterous parasites* and *coccinellidae* and bibliographical data.
Bibliographical data on *parasitism* in insects.
Information on a new method of culture of *Vibrio Comma* in liquid medium (4).
Help to obtain cultures of *Propionibacterium*, *Leishmania donovani*, *Entamoeba dysentrae*, *Schizotrypanum Cruzi* .
Information on plant hormones.
References on the influence of the composition of the soil on tobacco.
Grafts of Avocado varieties (4).
Bibliographical study on the introduction of plants in semi-desert regions.

IRAQ

Information, addresses and means of obtaining equipment for the dairy industry.
Information as to how to obtain a deep-sea thermometer.
Help to reprint "Flora Orientalis".
Contact with specialist on mosses and lichens.
Bibliography and seeds of early wheat varieties.

Bibliography on sugar-beet varieties grown on sandy soil and in ho regions, and sugar-canes resistant against brief cold (3) (4).
Bibliographical studies regarding the fight against *Euriguster integriceps*, and various other insects (4).
Information on the breeding of cattle in India (4).

LEBANON

References on recent works on cosmic rays (4).
Two series of special chemical reagents (small quantities).
Information on new methods of measuring terrestrial electricity.
Specimens of *Schistosoma bovis*.
Microscopic specimens of *trypanosomes*, *anaplasms* and *piroplasms*.
Statistics on diphteria, scarlet fever, " fièvre de Malte ", in Egypt and Iraq.
Help to recruit a professor in Radiology.
Assistance to obtain transportation grant.

SUDAN

Help to obtain paraffin embedding wax for histological examinations.
Bibliography on wind erosion and the fixation of sand dunes.
Bibliography on and contacts regarding the growing of fruit from temperate climates in tropical regions.
Help to find candidates for vacancies for an entomologist and a scientist for medical research.

SYRIA

Information about national organizations of manufacturers of scientific equipment.
Contact with laboratories specializing in vitamins and hormones where facilities for students are available.
Addresses of specialists in helmintology (trematodes).
Information about the programme and organization of technical studies
References on psychotechnique.
Help to find candidates for several scientific posts.

TURKEY

Bibliography on supersonic waves.
Bibliography on methods and equipment for exploring deposits of radio active minerals.
Information on sources of ribonuclease and desoxyribonuclease.
Bilharzia and *trachoma* specimens.
Documentation on the manufacture of anti-venomous serums.
References on means against malaria.
Bibliography on the techniques for fighting Nematodes.

THE FOREGOING REQUESTS EMANATED FROM THE FOLLOWING INSTITUTIONS

CYPRUS

Agricultural Department.

EGYPT

Ministry of Public Health.
Service des Antiquités.
Ministry of Agriculture.

Université Fouad 1er, Cairo.
University Faruk 1er, Alexandria.
Committee for Optical Instruments.
Committee for the Utilization of Solar Energy.
Fouad 1st Research Council.
Miscellaneous.

IRAN

University of Teheran.
Ministry of Agriculture.
Institut Razi.

IRAQ

Department of Agriculture.
Department of Industrial Research.
Department of Fisheries.

LEBANON

American University.
École Supérieure d'Ingénieurs.
Faculté Française de Médecine.
Ministry of Agriculture.

SUDAN

Gordon Memorial College.
Khartoum Veterinary School.
Sudan Plantation Syndicate.
Department of Agriculture.

SYRIA

Ministry of Education.
Syrian University.
Ministry of Agriculture.

TURKEY

Central Institute of Agriculture, Ankara.
Central Institute for Public Hygiene, Ankara.
Faculty of Agriculture, Ankara.
Faculty of Science, Istambul.
Mining Research and Exploration Institute, Ankara.
Miscellaneous.

(3) EAST ASIA OFFICE

CHINA

Help in initial selection and actual delivery of scientific equipment donated by Unesco.
Provision of Du Mont oscillograph for temporary use.
Help to obtain cultures of food yeast and purple sulphur bacteria.
References on methods of paper-making from bamboo pulp (4).
Information on synthetic gasoline production.
Advice on improvement of glass production.
References on the latest rural reform in Central Europe.

Collection of seeds of the *Setaria* millet group (wild).
Specimens of rust-resistant varieties of millet, wheat, rice and cotton seeds (1) (2) (4).
Carob bean seeds required from Sicily.
Pinus insignis seeds.
Avocado and pecan seeds required from Brazil (1).
Selection of seeds of Babasu Oil plant (1).
Specimen of wild sugar-cane from the Philippines, Indochina and Thailand.
90 sets of Academia Sinica anniversary distributed through Unesco, Paris (1) (2) (4).
Contact with anthropologists of the Philippines.
References concerning virus diseases of plants (1) (2) (4).
Information on wheat pests and wheat research stations.
Recent publications on citrus diseases (1) (2).
Specimen of Indian wood (4).
Information on cultivation of tung-oil tree and *Dioscorea batatas* (a publication on tung-oil tree varieties in China has been translated into English for publication).
Seeds and references on tyle tree.
Assistance to transmit article on the invention of gun powder to the " Archives Internationales de l'Histoire des Sciences ", Paris, for publication.
Assistance provided for a scientist to attend B.C.G. conference at the Pasteur Institute, in Paris.

PHILIPPINES

References on Newcastle disease of chickens (2).
Help to obtain Rinderpest lapinized vaccine (4).
Information on soil conservation (4).
Specimens of varieties of sugar-cane, corn, rice, coffee (1) (2).
Composition of sugar-cane varieties.
Wood samples for testing trees (1) (2).
Exchange of archaeological specimens.
Information on cattle breeding in India (4).
Exchange of herbarium specimens with Thailand and Indochina.

INDOCHINA

Information on recent scientific equipment.
Information on modern machinery for harvesting ramie.
Modern methods in designation of mineral deposits.
References on extraction of tung-oil.
Exchange of fresh seeds from the Philippines for trial.
Exchange of papaya, avocado and other tropical fruit seeds (1) (2) (4).
Help to obtain fresh rice samples for breeding.
Bibliography on modern methods of spraying insecticides from planes
Investigation of the possibility of introduction of new trees (1) (2) (4).
Sources of supply of old botanical books.
Exchange of marine specimens for books or scientific apparatus with other Marine Biological Stations.

THAILAND

Documentation and samples of *balsa* and *quinquina* seeds (1).
Information on grass resistant to six months' drought (1) (2) (4).

ENQUIRIES FROM COUNTRIES OUTSIDE THE REGION

CZECHOSLOVAKIA

Collection of wheat and different Chinese oil-plant seeds.

HUNGARY

Specimen of Far-Eastern wood for study of wood anatomy.

ITALY

Samples of three varieties of silk-worm eggs for genetics in Pavia.

SWEDEN

Specimen of ganoid fish *Psophurus*.

THE FOREGOING REQUESTS EMANATED FROM THE FOLLOWING INSTITUTIONS

CHINA

Academia Sinica
National Peiping Academy.
National Peking University, Peiping.
Agriculture Research Bureau, Nanking and Peiping.
Fukien Christian University.
Fukien Research Academy.
Lingnan University, Canton.
Peipei (Szechuen) Industrial Development.
Nanking University.
Sugar-Cane Corporation, Taiwan.
National Prevention Epidemic Bureau, Peiping.
Zikawei Observatory, Shanghai.
Iranian Embassy, Nanking.

PHILIPPINES

Bureau of Mines, Manila.
Bureau of Animal Industry, Manila.
Bureau of Forestry, Manila.
Bureau of Plant Industry, Manila.

INDOCHINA

Bureau of Mines, Saigon.
Ecole Supérieure des Sciences, Saigon.
Agricultural Research Institute, Saigon.
Office du Riz, Saigon.
Bureau des Forêts, Saigon.

THAILAND

Department of Forestry.
Department of Agriculture.

(4) SOUTH ASIA OFFICE

BURMA

Source of supply of scientific apparatus. e.g. refractometer, polarimeter.

INDIA

Legal advice on translating from foreign languages books for limited distribution.
Assistance for the publication of a science club journal.
Information about facilities for teacher training.
Information on and sources of supply of German and Japanese periodicals.
Help to obtain comparison microscopes.
Source of supply for scientific equipment, e.g. rocking microtomes, water surface thermometer, " stamin " nets, etc.
Information on permanent sources of alpha, beta and gamma rays.
Help to obtain meteorological data.
Expert advice on removal of a top layer of painting from tne basic painted walls and preserving both (2).
Assistance for upkeep of herbarium of fungi.
Information on Russian botanical work.
Information about facilities for algological research.
Information about research work on the eradication of malaria.
Films on health education, general education and sociology.
Literature on modern hydro-electric plants such as T.V.A., Shannon (Ireland), and the Yellow River Project (3).
References about alternative sources of rubber.
Report on work on synthetic rubber, mainly in Russia.
Developments in Australia in utilization of rubber-plant resources.
Development of penicillin manufacture in Russia.
Literature from and contact with biological centre.
Information " Société Entomologique de France ".
Contact with organizations of Special Libraries.
Information on the effects of use of fertilizers and manures in relation to productivity of the soil (1) (2) (3).
Reprinting of Soil Survey Manuel-Kellog.
Samples of seeds of plants of *Jasminum* from Madeira Islands and Formosa.
Samples of wheat and millet seeds (3).
Specimens and active principles of *Ammi visnaga* and *Ammi majus*, together with bibliographical studies and research reports (2).
Assistance for the publication of the Indian Journal of Dairy Science.
Forwarded a request for fellowship for gynaecological training.
Forwarded a request for travel grant for inviting an industrial bacteriologist to study sulphur deposition.

THE FOREGOING REQUESTS EMANATED FROM THE FOLLOWING INSTITUTIONS

BURMA

Chemical Examiner to the Government of India.

INDIA

Indian Institute of Science, Bangalore.
Indian Dairy Science Association, Bangalore.
College of Engineering, Benares.

Economist Botanist, Bombay.
Tata Institute of Fundamental Research, Bombay.
General Co-operative Malarial Society, Calcutta.
The Science Club, Calcutta.
University of Calcutta.
Archival Chemist (Government of India) Delhi.
Compost Development Office (Government of India), Delhi.
Council of Scientific and Industrial Research (Government of India), Delhi.
East Punjab University, Delhi.
Archaeological Chemist (Government of India), Delhi.
WHO, B.C.G. team, Delhi.
Tokaji Hao Hospital, Indore.
CMS High School, Indore.
Lucknow University, Lucknow.
Central Marine Fisheries Research Station, Madras.
Government Agricultural Chemist, Madras.
University Botanical Laboratory, Madras.
Department of Biochemistry, Indian Institute of Science, Bangalore.
Indian Lac Research Institute, Namkum.

APPENDIX III

VISITS AND CONTACTS

(1) LATIN AMERICA OFFICE

	No. of Institutions
ARGENTINE	14
BOLIVIA	3
BRAZIL	38
CHILE	10
COLOMBIA	15
COSTA RICA	2
CUBA	8
ECUADOR	6
GUATEMALA	4
GUIANA (British)	1
GUIANA (French)	1
HONDURAS	1
MEXICO	7
PARAGUAY	1
PERU	12
PUERTO RICO	4
DOMINICAN REPUBLIC	1
TRINIDAD	2
URUGUAY	15
VENEZUELA	7
GRAND TOTAL	152

(2) MIDDLE EAST OFFICE

	No. of Institutions
CYPRUS	
Athalassa	1
Morphou.	1
Nicosia	4
Saitta.	1
Trikoukkia	1
Troodos	1
TOTAL	9

EGYPT	
Alexandria	5
Baseili	1
Cairo	39
TOTAL	45
IRAN	
Teheran	9
Hessarek	1
TOTAL	10
IRAQ	
Arbil	1
Baghdad	14
TOTAL	15
LEBANON	
Beirut	15
Chtaura	1
Ksara	1
TOTAL	17
SUDAN	
Khartoum	9
SYRIA.	
Damascus	7
TURKEY	
Ankara	13
Istanbul	6
TOTAL	19
GRAND TOTAL	131

(3) EAST ASIA OFFICE

	No. of Institutions
CHINA	
Amoy	1
Canton	5
Changsha	1
Chungking	1
Foochow	4
Formosa	1

Hangchow	2
Hopei Province	2
Hsuchow	1
Kaifeng	1
Kansu (Lanchow)	1
Kianghua	1
Kunming	1
Kweilin	1
Lanchow	1
Mukden	1
Nanchang	2
Nanking	25
Peipong	26
Shanghai	20
Taiyuan	1
Tientsin	8
Tsingtao	1
Wuchang	1
TOTAL	109
Hongkong	2

INDOCHINA

Nhatrang	2
Phnom-Penh	1
Saigon	8
TOTAL	11

PHILIPPINES.

Baguio	2
Manila	21
TOTAL	23

THAILAND

Bangkok	3
GRAND TOTAL	148

(4) SOUTH ASIA OFFICE

	No. of Institutions
	—

AFGHANISTAN

Kabul	1

BURMA..

Rangoon	9

CEYLON

Colombo	9
Peradeniya	2
TOTAL	11

INDIA	
Agra (United Provinces)	3
Aligarh (United Provinces)	3
Allahabad	5
Bangalore	10
Benares (United Provinces)	1
Bombay	5
Calcutta	31
Calicut	4
Cinnamara (Assam)	2
Coimbatore	3
Coonoor (Nilgiris)	5
Dehra Dun	1
Delhi	23
Gauhati (Assam)	4
Hyderabad	2
Jadarpur	1
Cawnpore (United Provinces)	7
Krusadai Island	1
Lucknow	3
Madras	11
Mysore	4
Nagpur	4
Ootacamund	1
Patna (Bihar)	4
Santiniketan and Sriniketan (Bengal)	3
Shillong (Assam)	4
Simla (E. Punjab)	12
Tanjore	2
Trivandrum	3
TOTAL	162
INDONESIA	
Batavia	4
Buitenzorg	6
TOTAL	10
MALAYA	
Kuala Lumpur	3
Singapore	7
TOTAL	10
PAKISTAN	
Karachi	6
THAILAND	
Bangkok	10
GRAND TOTAL	219

APPENDIX IV

ATTENDANCE AT CONFERENCES

Apart from their normal activities, the Field Scientific Officers attend meetings and conferences from time to time, as observers or representatives for Unesco. Examples are as follows :

FAO Regional Conference for the Near East, Cairo, (Egypt February 1948).

FAO Meeting on Fisheries, Nutrition and Oceanographic Research (Baguio, Philippines, February 1948).

FAO Rice Conference (Baguio, Philippines, March 1948).

International Forestry and Forest Products Conference for Latin America (Teresopolis, Brazil, April 1948), called by FAO.

WHO Regional Committee (New Delhi, India, October 1948).

WHO Regional Committee for Eastern Mediterranean Area (Cairo, Egypt, February 1949).

Second World Engineering Conference (Cairo, Egypt, March 1949).

Inaugural meeting of the International Rice Commission (Bangkok, Thailand, March 1949), called by FAO.

Inaugural meeting of Indo-Pacific Fisheries Council, (Singapora, Malaya, March 1949), called by FAO.

Fourth Regional Conference of American State Members of ILO (Montevideo, Uruguay, April 1949).

Forestry and Timber Utilization Conference for Asia and the Pacific (Mysore, India, April 1949), called by FAO.

APPENDIX V

TECHNICAL LECTURES

During their visits in the regions, the Field Scientific Officers often give interviews and lectures on the work of Unesco and on the Field Science Co-operation Offices in particular, sometimes over the radio. They are also invited from time to time to give technical lectures, of which the following are some examples :

" Principles and effects of Atomic Energy " at the Public Health Institute, Montevideo.
" Genes and Organizers " to Royal Institute of Science, Bombay.
" Science and Society " at Aligarh.
" Fresh Water Algae " at Aligarh.
" Respiration of the Egg-cell " at Calcutta.
" Creation of a Global Tradition " in the Library of Western Thought, Shanghai.
" The Rôle of Bibliography in Scientific Research ", at Cairo.
" Cosmic Rays " at Montevideo University, at the Asociacion Uruguaya para el progreso de las Ciencias, and over the radio.
" Plant Hormones " at the Associacion Uruguaya para el Progreso de las Ciencias, and over the radio.
"Factors of Plant Growth" at Montevideo University.

APPENDIX VI. — PERSONNEL OF DIVISION OF FIELD SCIENCE CO-OPERATION

DEPARTMENT OF NATURAL SCIENCES

	Staff Member	*Position*	*Country*	*Scientific Field*
HEADQUARTERS.	Dr. P. AUGER	Head of Department.	France.	Physics.
	Mr. W. E. PURNELL	Chief of Division.	Australia.	Chemical Engineering.
	Dr. LU GWEI-DJEN	Assistant chief.	China.	Biochemistry.
	Mr. L. MATTSSON	Technical Assistant.	Sweden.	Industrial Chemistry.
	Miss I. DUDENEY	Technical Assistant.	U.K.	Scientific Documentation.
	Miss A. BARNETT ROBERTS	Secretary.	U.K.	
	Mme C. ASSET	Secretary.	France.	
LATIN AMERICA.	Dr. A. ESTABLIER	PFSO.*	Rep. Spain.	Biochemistry.
	Dr. N.B. CACCIAPUOTI	FSO.**	Italy.	Physics.
	Dr. O. DODERA	Temporary.	Uruguay.	Mathematics
	M. GIUNTOLI	Secretary.	Italy.	
	Mlle BOURGEOIS	Typist.	Uruguay.	
	Mlle NOGUEIRA.	Typist.	Uruguay.	
	Mr. E.J.H. CORNER †		U.K.	Botany.
	Dr. B. MALAMOS ††		Greece.	Parasitology.
MIDDLE EAST	Dr. L. THURIAUX	PFSO.	Belgium.	Agricultural Chemistry.
	Mr. K. BORCH	FSO.	Norway.	Mathematical Statistics.
	Dr. I. H. ABDEL RAHMAN	Consultant.	Egypt.	Astronomy.
	Mme J. BAHARI-LOOP	Secretary.		
	Mlle O. BIANCARDI	Secretary.		
	Mlle M. GAWLI	Secretary.		
EAST ASIA	Mr. J. SMID	Acting PFSO.	Czechoslovakia.	Civil Engineering.
	Mr. W.J. ELLIS	FSO.	Australia.	Biochemistry.
	Miss Y. B. DJU	Acting FSO.	China.	Industrial Welfare.
	Miss KU	Secretary.	China.	
	Mr. MA	Secretary.	China.	
SOUTH ASIA	Dr. A. WOLSKY	PFSO.	Hungary.	Experimental Biology.
	Dr. YIN HUNG-CHANG	FSO.	China.	Plant Physiology.
	Dr. C. Mervin PALMER	Associate.	America.	Botany.
	Mr. P.C. BANDYOPADHYAY	Assistant acting FSO.	India.	Chemistry.
	Mr. R.L. BHASIN	Secretary.	India.	
	Mr. V.P. KUNDRA	Secretary.	India.	

* Principal Field Science Officer. ** Field Science Officer. † Occupied post of PFSO until December 1948. †† Occupied post of FSO until July 1948.

BIBLIOGRAPHY OF THE FIELD SCIENCE CO-OPERATION OFFICES

	10 Nov. 45.	The place of Science and International Scientific Co-operation in Post-War World Organization (by Dr. J. Needham). *Nature* 1945, 156, 558.
Prep. Com/NS/12	Oct. 46	Science and Unesco, pp 18 ff.
C/23/NS.Dir. 2	Nov. 46	Resolutions, First General Conference (Paris).
NS/28	12 Jun. 47	Field Science Co-operation Offices; Origin, Authorization, Locations, Personnel, Functions.
DGB/43	47	Regulations governing Field Science Co-operation Officers.
2C/9	17 Sep. 47	Activities of the Nat. Sci. Section of Unesco for 1947.
2C/13	23 Sep. 47	Programme of the Nat. Sci. Section of Unesco for 1948.
2C/3	Nov. 47	Programme of Unesco for 1948.
2C/129 Rev.	Nov. 47	Resolutions, Second General Conference (Mexico City), No. 6 1 ff.
NS/46	18 Feb. 48	Interim Report on the Work of the Field Science Co-operation Offices.
8 Ex/21	7 Jul. 48	Information Report on the Personnel, Facilities and Work of the Field Science Co-operation Offices.
3C/Prg/5.1	Nov. 48	Field Science Co-operation Offices (Working Paper).
3C/3	Nov. 48	Report of Activities for 1948 by the Director-General (Dr. Julian Huxley) pp. 11, 73, 103.
	Nov. 48	Resolutions, Third General Conference (Beirut) No. 3. 1.
NS/67	14 Feb. 49	Activities of the Nat. Sci. Department for 1948, Sect. II.
Books		*Chinese Science*, by Dr. J. Needham Pilot Press, London 1945. *Science Outpost*, by Mrs J. and D.M. Needham, Pilot Press, London, 1948. *China*, by Dr. G. Winfield, Sloane, New-York, 1948.

DETAILED ADDRESSES OF THE FSCO'S

HEADQUARTERS	*Telephone No.*	*Cable Address*
Division of Field Science Co-operation, Unesco House, 19, avenue Kléber, Paris, 16e.	Kleber 5200 Ext. 2249.	Unesco-PARIS.
LATIN AMERICA		
Unesco Field Science Co-operation Office, Avenida Agraciada 1875, Montevideo, Uruguay.	Montevideo 92809.	Unesco - MONTEVIDEO
MIDDLE EAST		
Unesco Field Science Co-operation Office, 8, Sh. Salamlek, Garden City, Cairo, Egypt.	Cairo 77836.	Unesco-CAIRO.
SOUTH ASIA		
Unesco Field Science Co-operation Office, University Buildings, Delhi, India.	Delhi 5598	Unesco-DELHI.
EAST ASIA		
Unesco Field Science Co-Operation Office, UN Building. 106 Whangpoo Road, Shanghai, China.	Shanghai 40070 Ext. 2752.	Unesco-SHANGHAI.

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